

24 June 2010
Reference: 0116794

Ms. Marilyn St. Fleur
RCRA Facility Manager
United States Environmental Protection Agency
Region 1
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023



***Re: Response to Comments Regarding the Quality Assurance Project
Plan for Ongoing Activities at the Former CEE
Associates/InteliData Facility
80 Pickett District Road
New Milford, CT CTD044121697***

Dear Ms. St. Fleur:

In correspondence dated January 2007, the U.S. Environmental Protection Agency (EPA) provided comments related to the Quality Assurance Project Plan (QAPP) prepared by ERM Engineering & Consulting, Inc. (ERM) for the above-referenced site. ERM drafted this response, on behalf of CEE Associates (CEE), to address EPA's comments. Please note that the changes described herein have already been implemented, as appropriate.

For ease of reference, ERM has indicated EPA's comments in ***bold italics***. The numbering system below has been preserved from EPA's January 2007 correspondence.

Comments on September 2006 QAPP Revisions

1. Page 4-2, Section 4.2.1. Operation and Maintenance (O&M) of Soil Vapor Extraction/Air Sparge System

Some of the bullets in this section reference figures apparently provided in a separate document not included with the QAPP (e.g, the third bullet references Figure 12 in Appendix A, the fourth bullet references Figure 13 in Appendix A). Therefore as these figures could not be found in the

QAPP, the sampling locations for the Soil Vapor Extraction/Air Sparge System were not reviewed. Please include these figures in the QAPP.

These figures were inadvertently omitted from the September 2006 submittal. They are attached to this document for EPA's review and inclusion in the final QAPP.

2. Page 4-3, Section 4.2.1 Operation and Maintenance (O&M) of Soil Vapor Extraction/Air Sparge System

The first bullet states that the laboratory will analyze the CVOCs by Method TO-14A. Method TO-14A is missing from Appendix E Spectrum Analytical SOPs. Please add Spectrum Analytical TO-14A to the Appendix.

This SOP was inadvertently omitted from the September 2006 submittal. The SOP has been added to controlled copies of the QAPP and is attached to this document for EPA's review and inclusion in the final QAPP.

3. Page 4-9, Section 4.4 Analytical Methods

The Tables list 1,4-dioxane analytical method as Method 8260B. However, Table 8 Project Action Limits does not list the action limit for 1,4-dioxane. Spectrum Analytical Method 8260B lists the PQL as 20 ug/L for 1,4-dioxane. The response to General Comment 1 in the October 11, 2006 letter prepared by ERM stated that 20 ug/L will be used as the action limit. Please add the 1,4-dioxane limit to Table 8.

This change has been made. A copy of the revised Table is included for EPA's review and inclusion in the final QAPP.

4. Page 5-2, Section 5.2 Project Reports

The first paragraph states that the results of the ground water and soil vapor monitoring will be reported to the CT DEP. Please also report these results to the USEPA.

This change has been made. A copy of revised Page 5-2 is included for EPA's review and inclusion in the final QAPP.

5. Table 6 Sampling Matrix and Analytical Sampling Methods/SOPs

The samples collected for 1,4-dioxane analysis should not be preserved with HCl. Only cooling to 4°C is necessary. Please modify Table 6 accordingly.

Groundwater samples will be analyzed for 1,4-dioxane via EPA Method 8260B, in accordance with Spectrum Analytical's SOP (attached). The SOP, which complies with Connecticut's Reasonable Confidence Protocols (RCPs), specifies use of collection method 5030 or 5035, and requires the preservation of the aqueous sample with HCl in order to prevent the generation of daughter products or reduction in parent products due to biodegradation of organics prior to analysis. The compound 1,4-dioxane is not readily biodegradable and 1,4-dioxane is not a degradation biproduct. Therefore, pH adjustment of a sample to be analyzed for 1,4-dioxane to preserve contaminant concentrations is not required. However, EPA has not provided evidence that the addition of HCl will change the concentration of 1,4-dioxane in the sample or the laboratory's ability to meet project reporting limit requirements.

Currently, 1,4-dioxane is included in Spectrum Analytical's standard analyte list for Method 8260B and analyzed in concert with other VOCs, from a single sample. In order to provide an unpreserved sample for 1,4-dioxane analysis, an additional sample would need to be collected and prepared, increasing required sample volumes and analytical costs. Spectrum Analytical's SOP for 8260B, including HCl preservation, provides PQLs equal to the project action level of 20 ug/L for 1,4-dioxane. Based upon the data available, 1,4-dioxane and VOC analysis will continue to be conducted on a single aqueous sample preserved with HCl, using EPA Method 8260B.

6. Appendix F ERM Standard Operating Procedures Low Flow Sampling Procedure

Since the calibration procedures for the field parameters vary between manufacturers, please use the USEPA Region I Draft Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction potential [ORP], and turbidity), June 3, 1998 (enclosed), for consistency in instrumentation calibration.

ERM will use the provided EPA guidance for calibration of low-flow sampling instrumentation.

7. *Note that there was no comment number 7 in the EPA letter.*

Comments on October 11, 2006 Response to Comments

8. *Comment 8 from EPA's July 27, 2006 letter noted, among other things, that the low flow sampling procedure is designed for wells having a well screen length of 10 feet or less...[M]onitoring wells ERM-9, BR-1, BR-2, BR-3, BR-4, and BR-5 have screen lengths greater than 10 feet...For any overburden wells with well screens greater than 10 feet (ERM-9, for example), please explain what the data from these wells represent. Was any sampling performed in these wells at various depths to determine the optimum sampling depth(s)? If the low flow sampling procedure is used to sample wells with greater than 10 foot screen lengths, resulting groundwater data should be qualified as "estimated."*

Downhole geophysics were conducted in 2001 and 2006-2007 on bedrock wells BR-1, BR-2, BR-3, BR-4, BR-5, and the Production Well, to determine groundwater flow characteristics and optimal sampling depths. The results of the geophysics, as well as a pump test conducted on BR-1, were reported in the June 2002 *Summary Report and Phase III Work Plan* and the March 2008 *Annual Report: Status of Remediation*, both previously submitted to the CT DEP and EPA. Additionally, ERM conducted FLute© conductivity studies at bedrock wells BR-5 and BR-3 in 2007. The results of the FLute© studies are also summarized in the March 2008 *Annual Report Status of Remediation*.

These techniques were used to assess the likely presence of transmissive fractures in the competent bedrock. The critical findings were:

- Numerous possible fractures were noted, but only "weak" transmissivity was noted;
- FLute© evaluation indicated limited or no measurable water flow;
- A major water-bearing fracture was not encountered until 480 feet below grade (well bottom of Production Well).

The results of these analyses strongly suggest limited or nonexistent transmissivity in the competent bedrock. Limited transmissivity was noted in the shallower portions of the bedrock, most likely associated with weathered, more heavily fractured portions of the bedrock matrix.

The data from the geophysical studies indicated that very little preferential flow is present in the bedrock, suggesting no optimal “worst-case” sampling interval is present. Continued sampling at the midpoint of the borehole or screen section will provide comparability with historical data.

Monitoring well ERM-9, which was installed during the evaluation of potential historical releases from AOC 10, is the only overburden groundwater monitoring well in the proposed monitoring plan with a screen section greater than 10 feet. The data collected from this well will not be required to demonstrate post-remedial compliance with the CT Remediation Standard Regulations (RSRs), as no remediation of AOC 10 is required. No evidence of contamination was indicated during the installation of the well, and no contaminants have been detected in samples from this well (2001, 2004). Groundwater data from samples collected from this well are intended to act as an indication of overall groundwater quality on the southwestern portion of the site, and represent the average concentration in overburden groundwater from 5 to 25 feet below grade.

Table 6 lists MW-17 screen interval as “Unknown” and therefore it is unknown what this data represents...

MW-17 has been destroyed and is no longer included in the monitoring program.

The response to Comment 8 also states that, where possible, a peristaltic pump will continue to be used for low flow sampling to facilitate data comparability. As noted in EPA’s original comment, there are concerns relative to the use of peristaltic pumps, as they can cause degassing and loss of volatiles...EPA recommends that bladder pumps be used at wells where VOC concentrations are expected to be close to or below an action limit.

Groundwater monitoring will be conducted using CT DEP low-flow sampling protocols, which allow for the use of peristaltic pumps. This method is acceptable for monitoring VOC concentrations while the active treatment system is in operation, as it is currently. To achieve compliance with the RSRs (approved by EPA as the bright-line standard for the site), additional monitoring will be required once the system has been turned off to verify that groundwater concentrations remain below action levels. We plan to complete that portion of the monitoring effort using bladder pumps in response to EPA’s concern.

9. The October 11, 2006 response to Comment 9 explains the approach to be used for instrument calibration. The response states "only if a significant variance from the standards is observed will the instruments be calibrated in the field prior to initial use." The term "significant variance" does not appear to be defined. Please provide a definition for this term in the QAPP so that the sampler knows how to compare these two values.

Rather than only calibrating instruments if/when a significant variance from the standards is observed, instruments will be calibrated in the field daily prior to initial use and a calibration check will be performed at the end of the day after sampling to determine if the instrumentation remained calibrated throughout the day. A copy of the relevant and revised section of the QAPP is included for EPA's review and inclusion in the final QAPP.

Sincerely,



Robert Drake, P.E., Ph.D, L.E.P
Senior Project Manager



Kevin P. King, LEP
Principal

Attachments

cc: Andrew Davis, Dewey & LeBoeuf LLP

ATTACHMENT A (COMMENT 1)
FIGURES 12 AND 13

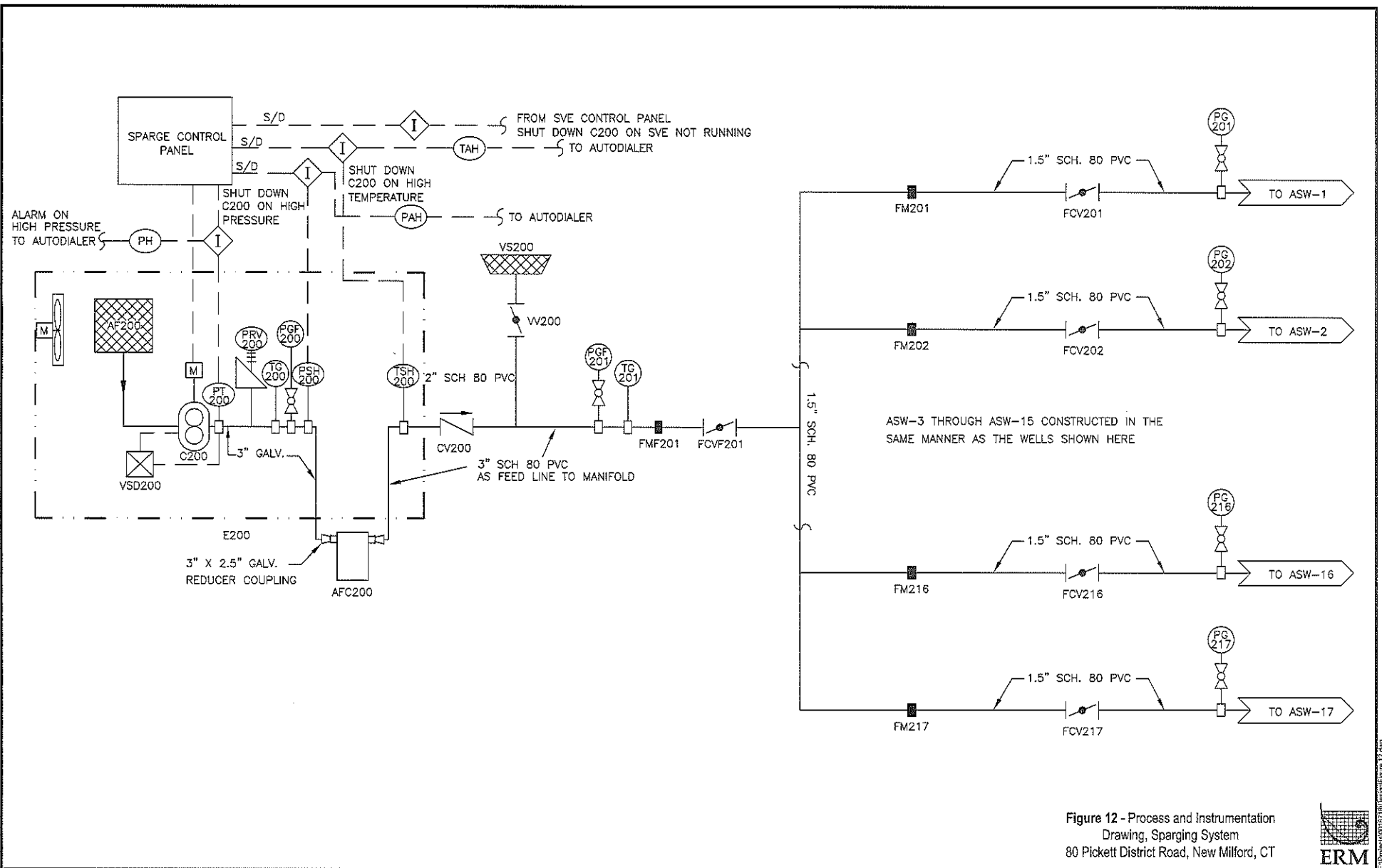


Figure 12 - Process and Instrumentation
Drawing, Sparging System
80 Pickett District Road, New Milford, CT

ATTACHMENT B (COMMENT 2)
SPECTRUM ANALYTICAL TO-14A

SPECTRUM ANALYTICAL, INC
Featuring
Hanibal Technology
11 Almgren Drive
Agawam, MA 01001

Standard Operating Procedure
For
METHOD TO-14A

Determination Of Volatile Organic Compounds (VOCs)
In Ambient Air Analysis Using Specially Prepared Canisters
With Subsequent Analysis By Gas Chromatography

Prepared by

Date

Reviewed by

Date

Lab Director

Date

TABLE OF CONTENTS

STANDARD OPERATING PROCEDURE
for
Air Analysis Method TO-14A

I.	SCOPE AND APPLICATION	3
II.	SUMMARY OF METHOD	4
III.	DEFINITIONS	4
IV.	INTERFERENCES	5
V.	APPARATUS AND MATERIALS	5
VI.	REAGENTS	6
VII.	SAFETY	6
VIII.	SAMPLE COLLECTION, PRESERVATION AND HANDLING	6
IX.	QUALITY CONTROL	7
X.	CALIBRATION	7
XI.	PROCEDURE & CALCULATIONS	8
XII.	METHOD PERFORMANCE	10
XIII.	POLLUTION PREVENTION	10
XIV.	DATA ASSESSMENT AND ACCEPTANCE	10
XV.	CORRECTIVE ACTIONS	10
XVI.	CONTINGENCIES FOR OUT-OF-CONTROL DATA	11
XVII.	WASTE MANAGEMENT	11
XVIII.	REFERENCES	11

I. SCOPE AND APPLICATION

This method is applicable to the determination of VOC's in whole air sampling. The samples are collected in either Tedlar bags or Summa Canisters (stainless steel or specially prepared canisters such as silcosteel or siloniate). The VOC's are separated by gas chromatography and detected by a mass spectrometer. The VOC's in this method have been tested and determined to be stable in pressurized and sub-ambient canisters. These compounds are detected at low PPBv levels. The compounds of interest are as follows:

<i>COMPOUNDS OF INTEREST</i>	
Compound Name	Compound Name
1,1,1-Trichloroethane	Benzene
1,1,2,2-Tetrachloroethane	Benzyl chloride
1,1,2-Trichloroethane	Bromomethane
1,1-Dichloroethane	Carbon tetrachloride
1,2,4-Trichlorobenzene	Chlorobenzene
1,2,4-Trimethylbenzene	Chloroethane
1,2-Dibromoethane	Chloroform
1,2-Dichlorobenzene	Chloromethane
1,2-Dichloroethane	Dichlorodifluormethane (Freon 12)
1,2-Dichloroethane(cis)	Ethylbenzene
1,2-Dichloropropane	Hexachlorobenzene
1,2-Dichlorotetrafluoroethane (Freon 114)	m/p Xylene
1,3,5-Trimethylbenzene	Methylene chloride
1,3-Dichlorobenzene	o-xylene
1,3-Dichloropropene (cis)	Styrene
1,3-Dichloropropene (trans)	Tetrachloroethane
1,4-Dichlorobenzene	Toluene
4-Ethyltoluene	Trichloroethene
	Trichlorotrifluoroethane (Freon 113)
	Vinyl chloride

II. SUMMARY OF METHOD

- A. After samples are logged in, the canister pressure is recorded from the gauge on the cans (if canister does not have a gauge, attach a vacuum gauge to valve and record pressure). Tedlar bags do not have pressure recorded. If the canister is below 15 psig, the can must be pressurized to 0 psig. The client information on the canister is then verified comparing to the COC and the canister is then shelved to wait for analysis.
- B. Analysis consists of placing the sample on a 16 position Entech autosampler/concentrator. An aliquot of sample (mls) is drawn from the canister measured by a mass flow controller (MFC). The sample is preconcentrated removing water and CO₂ from the sample. It is then transferred to the GC where separation of the compounds occurs. The compounds are detected by a quadrupole low-resolution mass spectrometer in full scan mode. After analysis, data is reviewed and approved. The canister is removed from the autosampler and put onto the canister cleaner for cleaning, then storage ready for reuse.
- C. Method TO-14A employs a Nifion Dryer for removal of water. The laboratory has modified the technique in water removal by substituting the water removal system of TO-15 which employs a technique of trapping the sample on a solid adsorbent using a cryogenic cooling system to bring the sample to -190 degrees C. This is a more effective technique for water removal.

III. DEFINITIONS

- A. Whole Air Sample – An air sample technique that does not selectively sample certain components onto a specific sampling media. Instead, an aliquot of air is drawn into a Passivated Sampling Canister and a measured amount of the air is used as the sample.
- B. PPBv – Parts Per Billion by Volume
- C. PPMv – Parts Per Million by Volume
- D. Pressurized Sampling – collection of an air sample in a canister with a (final) canister pressure above atmospheric pressure, using a sample pump.
- E. Subatmospheric Sampling – collection of an air sample in an evacuated canister at a (final) canister pressure below atmospheric pressure, without the assistance of a sampling pump. The canister is filled as the internal canister pressure increases to ambient or near ambient pressure.
- F. Cryogenic Cooling – A refrigerant used to obtain very low temperatures in the cryogenic trap of the analytical system. A typical gas used for cryogenic cooling is

liquid Nitrogen (bp –195.8 Celcius) or liquid Argon (bp –185.7 degrees Celcius).

- G. Mass Flow Controller – A device that is able to measure the flow of air or gases in milliliters.
- H. Summa Canisters – Summa is a trade name for the sampling container of a whole air sample. The container is either made from electropolished stainless steel or a inert coating of the surface. Canisters with the inert coating are called Passivated Sampling Canisters.
- I. Flow Controllers – Passive devices that attach to the top of the canisters and regulate the flow of air into the canisters. Controllers can be set from 0.5 hour to 1 week for a sampling time duration.
- J. Grab Sample –Sample taken without the use of a flow regulator.

IV. INTERFERENCES

- A. Interference can occur from an excess of moisture that is not removed by the instrument. Moisture buildup is also possible if many saturated samples are analyzed consecutively.
- B. Improper cleaning of Summa Canisters and Passive Flow Controllers will result in contaminated equipment.

V. APPARATUS AND MATERIALS

- A. Summa Canisters - 6 Liters (silcosteel or silonite)
- B. Passive Flow Controllers (silcosteel or silonite)
- C. Entech 7100 autosampler and concentrator
- D. Hewlett Packard 6890 Gas Chromatograph
- E. Hewlett Packard 5973 MSD
- F. Restek RTX-1, 60 M, 0.32mm ID, 1.0 um df chromatographic column
- G. Entech 4620 Dynamic Diluter, 5 channel
- H. Entech 3100 Canister Cleaner, 16 position

VI. REAGENTS

- A. Liquid and Vapor N₂
- B. Chromatographic grade He
- C. Internal Standards (4 cmpds) -1PPMv Spectra Gases
- D. TO-15 Calibration Mix (62 cmpds) -1 PPMv Spectra Gases
- E. Quality Control Std. (62 cmpds) -1PPMv Spectra Gases (independent formulation from calibration TO-15 std)
- F. 4-Bromofluorobenzene Tuning Solution

VII. SAFETY

To maintain the application of OSHA regulations regarding the safe handling of the chemicals specified in this method, the laboratory must follow proper safety procedures:

- A. All chemicals should be transported on a cart when moved from room to room.
- B. The analyst must dispose of all unwanted chemicals and acids in properly marked containers inside the hood and chemical cabinets. (See Spectrum's waste disposal plan.)

VIII. SAMPLE COLLECTION, PRESERVATION, AND HANDLING

- A. Whole air sampling can be performed with either Summa Canisters or Tedlar bags. Summa Canister – sampling can occur either by taking Grab samples or can be sampled over a period of time by using a passive flow controller. The canister is under vacuum (-30 in Hg). This vacuum draws the sample (air) into the canister when the valve is open. A grab sample is taken immediately without the use of a flow controller. It only takes 20 – 30 seconds to fill a 6 Liter without the controller. This is used in acute situations and data should only be interpreted as screen data only.

Another technique is using passive flow controllers. Passive flow controllers restrict the flow of air drawn into the canister. They can be regulated at 5min, 15min, 0.5 hr., and between 1hr through 1 week. The longer time duration of sampling allows for a more representative sample. Any time interval less than 2 hrs is considered a screen.

- B. Passive flow controllers are cleaned with synthetic air between use and recalibrate prior

to sending back out into the field.

IX. QUALITY CONTROL

The quality control associated with this method is modified for additional QC then required by method. The additional quality control implemented is as follows:

1. Independent laboratory fortified blank
2. Internal standard criteria
3. Addition and reporting of a surrogate standard
4. Method blank required before analytical sequence

X. CALIBRATION

A. 4-Bromofluorobenzene(BFB) – Tuning Std.

100ng BFB is injected into instrument with ISTD for first initial calibration STD or continuing calibration. BFB criteria is as follows:

MASS	ION TUNING CRITERIA
50	15 to 40% of mass 95
75	30 to 60% of mass 95
95	Base peak, 100% relative abundance
96	5 to 9% of mass 95
173	<2% of mass 174
174	>50% of mass 95
175	5 to 9% of mass 95
176	>95% but <101
177	5 to 9% of mass 174

Standard and sample analysis is valid for 24 hours following valid BFB.

The calibration mixes are blended using the Entech 4620 Dynamic Diluter. Two standards are prepared. The lower concentration is a 10 PPBv and the other is a 50 PPBv. The calibration consists of at least a five-point curve. Stds are at concentration of 2PPBv, 5PPBv, 10 PPBv, 25PPBv, 50 PPBv and 100 PPBv. The 2 PPBv, 5 PPBv & 10 PPBV stds are analyzed from the 10 PPBv std and the 25 PPBv, 50 PPBV and 100 PPBv. Stds are analyzed by the 50 PPBv std. The different concentration is based on volume adjustment of the working std.

A 10 PPBv std is used as a daily continuing std. The QC std is prepared and analyzed at

10 PPBv.

Initial calibration requires %RSD of 30% for all cmpds, with two exceptions up to a limit of 40%.

Continuing calibration requires a %D of 30.

- B. Method Blanks are analyzed before samples and after stds. A blank consists of a Summa Canister pressurized with N₂ and carried through the same analytical process as the samples. Any components detected in the blanks are required to be below the MDL before analyzing samples.
- C. Internal Standards are compounds added to sample that are unlikely to be found in environmental samples (deuterated compounds are commonly used). The response is similar to the compounds detected in the samples. The internal standards are as follows:

Bromochloromethane
1,4-Difluorobenzene
Chlorobenzene-d₅

The IS criteria is + or – 40% of the mean area response from the most recent calibration. The retention time must be + or – 0.33 min from the retention time of the most recent calibration.

XI. PROCEDURE & CALCULATIONS

- A. Canister pressure is recorded from gauge (psig) on cans or manually attach a vacuum gauge to valve and open it. If canister is < -15 in Hg, the canister will need to be pressurized to 0 psig(14.0 psia). This will be performed by the dynamic diluter and a dilution factor will result. The canister(or Tedlar Bag) is attached to the 16 position autosampler. All valves are kept closed and a leak check and line flush are performed for each sample line. This procedure verifies that no leaks are present and that the lines are clean. After this procedure the valves are open.
- B. Analysis of samples begin after tuning std, continuing calibration, blanks and QC pass criteria. A sequence is set up on both the Entech system and on the HP MSD. An aliquot is withdrawn from each canister, preconcentrated, separated and analyzed by the MSD.
- C. After analysis all samples are checked for surrogate, IS criteria and saturation of compounds. If target compounds exceed the linear range of the curve, a dilution of the sample is necessary. This position on the autosampler will require flushing, possibly several times due to the type and concentration of contamination.

- D. Calculations are based on the internal standard technique.

$$C_x = A_x C_i S D F / A_i S R R F$$

C_x = compound concentration, ppbv

A_x = Area of the characteristic ion for the compound to be measured, area counts

A_i = Area of the characteristic ion for the specific internal standard, area counts

C_i = Concentration of the internal standard spiking mixture, ppbv

$R R F$ = Relative response factor from the continuing calibration level of the initial curve

$D F$ = Dilution factor

- E. Canister Cleaning.

All canisters are cleaned after sample analysis and prior to reusing. They are cleaned on a 16 position Entech Canister Cleaner. Canister with pressurized samples should be vented into a hood prior to placing in cleaner. Canister are attached and fitting are tighten. A leak check is performed and the can heaters are heated to 100 degrees C. The valves are opened and a roughing pump evacuates the canisters.

Each canister is evacuated and then pressurized with synthetic air. All 16 cans will cycle through this process 3X. Each cycle will roughly take 1.5 hrs. At the completion of the third cycle, the molecular drag pump is activated and all canisters are brought to a vacuum of < 50 millitorr. The pump down with the molecular drag pump is about 1.5 hrs – 2 hrs. The total canister cleaning time can be 6-7 hrs.

At the completion of the process, one canister is chosen for batch analysis. It is pressurized to 30 psig with N₂ and then analyzed. If all compounds are below the MDL of the method it is considered clean. Upon completion of analysis the canister is put back on the cleaner and brought to < 50 millitorr. All canisters from that cleaning batch are labeled, documented in a cleaning logbook and placed in storage. The canister will then stay there until prepped prior to being sent out.

XII. METHOD PERFORMANCE

See Table 1.

XIII. POLLUTION PREVENTION

The air laboratory is designed to eliminate any pollution that may be generated by the laboratory. Procedures are in place to deal with pollution from either samples or standards. The laboratory air is recirculated through additional air scrubbers to maintain a volatile free atmosphere within the laboratory.

All instrumentation for standards formulation and sample analysis are based on closed systems to eliminate exposure to the atmosphere. If a neat std is used to formulate a std, a hood is used to prevent any possible contamination or pollution. High level samples are flushed in a hood prior to placing on the canister cleaner to avert any contamination from this source.

Additional laboratory procedures for pollution prevention can be found in the chemical hygiene plan.

XIV. DATA ASSESSMENT AND ACCEPTANCE

The criteria for acceptable data is as follows:

1. BFB passes performance std criteria (opens 24 hr window)
2. Initial calibration < 30% RSD with two exceptions limited to <40% RSD.
3. Continuing Calibration + or – 30% D
4. Surrogate recovery for all samples 70% - 130%
5. Laboratory fortified Blank recovery limits 70% - 130%
6. Contamination free method blanks

XV. CORRECTIVE ACTION

Any data that is not within acceptable criteria is considered out of control. Each is evaluated on a case by case basis to determine the cause of the problem and the corrective action for the data. Generally, reanalysis occurs, but occasionally data is flagged.

XVI. CONTINGENCIES FOR OUT-OF-CONTROL DATA

The procedure for handling out-of-control data begins at the analyst level. If data of this quality is generated it is brought to the attention of the laboratory manager. The laboratory manager reviews the data, the causes and the different options. The laboratory manager may discuss the data with the quality control dept and the laboratory director. A final decision is made and documented.

XVII. WASTE MANAGEMENT

Refer to Laboratory Chemical Hygiene Plan.

XVIII. REFERENCES

EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-14A, Determination of Volatile Organic Compounds (VOC's) in Ambient Air using Specially Prepared Canisters with Subsequent Analysis by Gas Chromatography

EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-15, Determination of Volatile Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)

ATTACHMENT C (COMMENT 3)
TABLE 8 PROJECT ACTION LIMITS

Analyte	Matrix	Table 8: Project Action Limits					Project Quantitation Limit (dry weight)	Achievable Laboratory Limits	
		Proposed GW Res VC (ug/L)	Proposed GW I/C VC (ug/L)	SWPC (ug/L)	Proposed Soil Vapor Res VC (ppmv)	Proposed Soil Vapor I/C VC (ppmv)		MDLs ²	QLs ²
1,1,1-Trichloroethane	Ground Water	6,500	16,000	62,000	---	---	1.00 ug/l	0.530 ug/l	1.00 ug/l
1,1,2-Trichloroethane	Ground Water	220	2,900	1,260	---	---	1.00 ug/l	0.930 ug/l	1.00 ug/l
Trichloroethene	Ground Water	27	67	2,340	---	---	1.00 ug/l	0.460 ug/l	1.00 ug/l
1,2,4-Trimethylbenzene	Ground Water	360	4800	---	---	---	1.00 ug/l	0.660 ug/l	1.00 ug/l
1,3,5-Trimethylbenzene	Ground Water	280	3900	---	---	---	1.00 ug/l	0.540 ug/l	1.00 ug/l
1,4-dioxane	Ground Water	**20	**20	**20	---	---	20.0 ug/L	4.87 ug/L	20.0 ug/L
Vinyl chloride	Ground Water	1.6	52	15,750	---	---	1.00 ug/l	0.860 ug/l	1.00 ug/l
Total Lead	Ground Water	---	---	13	---	---	7.50 ug/l	2.30 ug/l	7.50 ug/l
Total Chromium*	Ground Water	---	---	110	---	---	5.00 ug/l	2.40 ug/l	5.00 ug/l
Total Barium	Ground Water	---	---	---	---	---	5.00 ug/l	1.70 ug/l	5.00 ug/l
Total Zinc	Ground Water	---	---	123	---	---	5.00 ug/l	3.90 ug/l	5.00 ug/l
Total Copper	Ground Water	---	---	48	---	---	5.00 ug/l	1.60 ug/l	5.00 ug/l
Total Cyanide	Ground Water	---	---	52	---	---	1.00 ug/l	4.00 ug/l	1.00 ug/l
CT ETPH	Ground Water	---	---	---	---	---	0.100 ug/l	0.0200 ug/l	0.100 ug/l
Total PCBs	Ground Water	---	---	0.5	---	---	0.5 ug/L	0.0155 ug/L	0.0200 ug/L
Bromomethane	Soil Vapor	---	---	---	---	---	0.000500 ppmv	0.000430 ppmv	0.000500 ppmv
Chloroethane	Soil Vapor	---	---	---	140	260	0.000500 ppmv	0.000470 ppmv	0.000500 ppmv
Chloroform	Soil Vapor	---	---	---	0.078	0.14	0.000500 ppmv	0.000230 ppmv	0.000500 ppmv
1,2-Dibromoethane (EDB)	Soil Vapor	---	---	---	0.0005	0.0007	0.000500 ppmv	0.000160 ppmv	0.000500 ppmv
1,2-Dichlorobenzene	Soil Vapor	---	---	---	9.2	95	0.000500 ppmv	0.000180 ppmv	0.000500 ppmv
1,3-Dichlorobenzene	Soil Vapor	---	---	---	9.2	95	0.000500 ppmv	0.000190 ppmv	0.000500 ppmv
1,4-Dichlorobenzene	Soil Vapor	---	---	---	3	5.5	0.000500 ppmv	0.000500 ppmv	0.000500 ppmv
1,1-Dichloroethane	Soil Vapor	---	---	---	14	150	0.000500 ppmv	0.000240 ppmv	0.000500 ppmv
1,2-Dichloroethane	Soil Vapor	---	---	---	0.013	0.11	0.000500 ppmv	0.000220 ppmv	0.000500 ppmv

ATTACHMENT D (COMMENT 4)
REVISED PAGE 5-2 FROM REPORT

The results of the technical systems audit will be documented in a Memorandum to file, to be maintained in ERM's East Hartford office.

Laboratory Performance Evaluation

The Quality Assurance Manager will review, on an annual basis, the results of Performance Evaluation (PE) samples analyzed by the fixed laboratory. The laboratory's performance will be evaluated to ensure that data obtained will continue to meet the project DQOs. In the event that the laboratory does poorly on critical PE sample analyses, the Quality Assurance Manager has the ability to: 1) request additional QA/QC measures be performed for samples submitted for analysis, 2) review additional data provided by the laboratory that may indicate the PE results were anomalous, and/or 3) select another state-certified laboratory, provided that the alternate laboratory can comply with the QAPP. Any corrective actions taken will be documented in a Memorandum to File, to be maintained in ERM's East Hartford office.

Management System Audits

At the close of each quarterly ground water and/or soil vapor sampling event, the Project Manager will conduct an assessment of the management system. In order to ensure that DQOs are met, the assessment will include an evaluation of communication systems and chain of command effectiveness, assessment of scheduling issues, and verification that sampling plans, protocols, and analytical methods remain appropriate in light of recently acquired data. Any concerns or changes to the QAPP or project based upon these assessments, will be documented in a Memorandum to File, and maintained in ERM's East Hartford office.

5.2

PROJECT REPORTS

The results of the ground water and soil vapor monitoring will be reported and submitted to the CT DEP and US EPA on an annual basis. The reports will provide a summary of the Scope of Work, methods, results, conclusions and recommendations derived from the sampling. The report will include a conceptual model of the site, including environmental setting, hydrogeology, historical site use, and contamination source/assessment. The report will identify any data gaps that may require additional study or action, and evaluate the effectiveness of remedial measures taken at the site. Essential components of the report will include:

- Summary of field work and analytical methods,
- Summary of data obtained (tables and figures),
- Comparison of analytical data to benchmark standards,

ATTACHMENT E (COMMENT 5)
TABLE 6 - 1,4-DIOXANE ANALYSIS
REVISION

Table 6: Sampling Matrix and Analytical Sampling Method/SOPs														
Sampling Location ^{1,2}	Location ID Number	Medium/ Matrix	Sampling Event	Analytical Parameter						QA/QC Samples		Screen Depth (feet)	Sample Depth (feet)	# Samples (include field duplicates/ replicates)
				VOCs, plus 1,4-dioxane (8260)	Total Cyanide	CT ETPH	Total Ba, Cr, Cu, Pb, Zn	Total PCBs	VOC (TO-14A)	Duplicates	MS/MSD			
	BR-3			X			X					Open hole 120	Mid Point of Water Column	8
	BR-4			X			X				Open hole 120	8		
	BR-5			X			X				Open hole 120	8		
	MW-17			X					X			Unknown	Middle of Water Column (if ≥ 4' from bottom of well) ³	8
	1			SVE-1	Soil Vapor	SVE/AS Opt GWM, and Post-Remedial/Compliance GWM						X		
SVE-2									X			3.0-7.0	32	
SVE-3									X			2.5-6.5	32	
SVE-4									X	X		3.0-7.0	64	
SVE-5									X			3.0-7.0	32	
SVE-6									X			3.0-7.0	32	
SVE-7									X			3.0-7.0	32	
Sampling SOP				SW-846 8260B			SW-846 9012A	CT ETPH	SW-846 6010B	SW-846 8082	TO-14A			
Sample Volume				80 ml	500 ml	1 L	500 ml	1 L	6 L					
Containers #, size, type				2, 40 ml, glass w/teflon	1, 500 ml, glass/plastic	1, 1L, amber glass w/teflon	1, 250 ml, glass/plastic	1, 1 L, glass/teflon	1, 6 L, silcosteel					
Preservation (chemical, temperature, light protected)				HCl to pH<2, Cool 4 °C, amber glass; No HCl for dioxane samples	NaOH to pH>12, Cool 4°C	HCl, Cool to 4°C, amber glass	HNO ₃ to pH<2, Cool 4°C	Cool 4°C, amber glass	None					
Maximum Holding Time To Preparation and Analysis				14 days	14 days	Extracted 14 days Analyzed 40 days	6 months	Extracted 14 days Analyzed 40 days	28 days					

¹Indicate critical field sampling locations “1”.

²Indicate background sampling locations “2”.

³If the water column is less than 4’ thick, the pump intake will be set a minimum of 2’ from the bottom of the well, as allowable, or at the least practicable depth if the depth to water is less than 2’ from the bottom of the well.

ATTACHMENT F (COMMENT 6)
INSTRUMENT CALIBRATION

transport techniques, and any associated bias/accuracy issues. No contaminants should be detected above the laboratory quantitation limits. Any detection will be flagged in the final laboratory data reports.

ERM will also submit temperature blank per cooler of ground water samples, to verify that samples have been preserved at approximately 4 degrees Celsius, as recommended by most analytical methods. Samples exceeding the holding temperature by significant degrees will be flagged in the final laboratory report.

No bottle blanks will be collected or analyzed, as all water and vapor sample containers will be supplied and certified clean by the laboratory.

Laboratory quality control methods are summarized in the attached Tables 11a-14.

4.6 *INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE*

ERM personnel will inspect equipment for evidence of damage or malfunction daily, prior to the start of field operations. If evidence of damage or malfunction is observed, ERM will perform routine maintenance only on multi-parameter probes, as described in ERM's SOPs and manufacturer's instructions (ERM's *YSI Care & Maintenance* and *YSI 600 Series Sonde Manual*). No ongoing instrument/equipment testing or maintenance will be performed by ERM personnel, as all equipment will be tested and maintained off-site by the supplier, U.S. Environmental Rental. If routine maintenance (replacement of filters and/or membranes) cannot resolve the issue, the unit will be replaced. If difficulty is encountered with peristaltic pumps or water level indicators supplied by U.S. Environmental Rental, these will also be replaced. No maintenance will be performed on these items by ERM personnel.

Laboratory instrument/equipment testing will be performed in accordance with Spectrum's SOPs and internal Quality Assurance Manual (June 2004). Laboratory instrument/equipment testing frequencies and procedures are summarized in Table 12.

4.7 *INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY*

Field equipment will be calibrated at a minimum frequency of once per day (prior to the start of the field operations) and a post-sampling calibration check will be performed to determine if the equipment remained in calibration throughout the day. Should anomalous data be encountered, ERM will recalibrate the equipment or instrument in question immediately in

accordance with manufacturer's instructions. If the issue cannot be resolved, the Project Manager and Field Team Leader will be notified to evaluate whether or not it will prevent compliance with sampling SOPs or attainment of project DQOs. If necessary, the Project Manager will request a replacement unit from the supplier for same day delivery and use.

Laboratory instrument/equipment calibration will be performed in accordance with Spectrum's SOPs and internal Quality Assurance Manual. Laboratory instrument/equipment calibration frequencies and methods are summarized in Tables 13-14.

4.8 INSPECTION/ACCEPTANCE FOR SUPPLIES AND CONSUMABLES

Laboratory Supplies

ERM will be supplied sample containers, labels, chains of custody, custody seals, and QA/QC items by the fixed laboratory a minimum of 1 day prior to scheduled field operations. ERM will inspect the deliveries for completeness and acceptability prior to mobilizing to the site for sample collection. Items to be inspected will include:

- Sample containers
 - Bottles, Certified Clean - The total number and type of sample containers will be compared to the Bottle Request Form, previously submitted by ERM personnel. In addition, sample containers will be inspected for cracks, broken seals/glass, loss of preservation fluids, or other conditions which would either hinder sample preservation and transfer from the site to the laboratory or endanger sampling and handling personnel.
 - Summa Canisters and Filters - The total number of canisters and filters will be compared to the Sample Container Request Form, previously submitted to the laboratory by ERM personnel. Each summa canister will also be inspected to ensure that it is under sufficient vacuum to draw a sample when the valve is opened by checking the pressure valves. The valves should read approximately - 30 inches of mercury.
- Sample Labels and Chains of Custody - ERM personnel will ensure that enough labels and chains of custody have been provided to address the number of samples and individual containers to be submitted to the laboratory.